

tlest change gives us an important measure of the quality of vision. This kind of testing is called contrast sensitivity. There are two clinical testing systems in use today. The first presents to the patient sine wave gratings in which either the frequency or the contrast can be changed. Each eye is independently shown a target of vertical gratings. The grayest resolvable grating represents the contrast sensitivity for that frequency. The gratings are then made narrower and the entire process is repeated. The second system is easier to administer and is clinically more available. A patient simply is shown different-sized letters that are grayed out until they can no longer be read. This system is easier to do clinically and relates contrast sensitivity to the standard Snellen notation.

Another important measure of functional vision is how well we see in situations of glare. It is possible to have normal acuity and contrast sensitivity and to be completely blinded in the presence of any strong extraneous light source. Frequently patients have complaints of headlights obscuring their night vision. Even during the day, strong front lighting can wash out their vision. New tests have been devised that challenge acuity and contrast sensitivity in the presence of a glare source.

As we age, acuity may remain in the 20/20 range but our contrast and glare capabilities diminish. Frequently by age 70, patients' contrast has so diminished that they have difficulty driving at night. In the dark, it is hard to see on poorly illuminated roads. Tests based on contrast sensitivity may be used in the future to assess a person's visual fitness for driving.

Cataracts are a disorder of aging that can be well evaluated with the above tests. Various government reimbursement programs now require certain visual standards before they will allow ocular operations. Hence, measuring contrast and glare in addition to standard Snellen acuity is a useful adjunct in further characterizing visual loss.

CLIFFORD TERRY, MD
Fullerton, California

REFERENCES

- Campbell FW, Robson JG: Application of Fourier analysis to the visibility of gratings. *J Physiol (Lond)* 1968; 197:551-566
- Sturgis SP, Osgood DJ: Measuring the quality of drivers' night vision. *Proc Human Factors Soc* 1981; 25:38-42
- Terry CM, Brown PK: Clinical measurement of glare effect in cataract patient. *Ann Ophthalmol* 1989; 21:183-187

Extended-Wear Soft Contact Lenses

ACCORDING TO A RECENT Food and Drug Administration survey, nearly 20 million Americans wear contact lenses with most using soft lenses. Soft contact lenses can be used either on a daily-wear basis in which the lenses are removed and disinfected each day or on an extended-wear basis with the lenses worn overnight for a variable number of days. The most serious complication of contact lens use is bacterial corneal ulcers, which may result in corneal scarring and loss of vision requiring corneal transplantation.

Recent reports suggest that the risk of bacterial corneal ulcers is greater with the use of extended-wear than daily-wear soft contact lenses. A multicenter case-control study confirmed this observation and showed that users of extended-wear soft contact lenses who wore them overnight had a risk of bacterial corneal ulcers that was 10 to 15 times as great as that for users of daily-wear soft contact lenses.

Bacterial corneal ulcers in contact lens wearers probably require two conditions: the presence of pathogenic microorganisms that may be contaminating the eye or some aspect

of the care system and a break in the corneal epithelium either from trauma or hypoxia caused by the contact lens. The use of an extended-wear soft contact lens may be associated with chronic corneal hypoxia that may disturb epithelial metabolism and result in epithelial defects through which pathogenic bacteria gain access to the corneal stroma.

Disposable soft contact lenses are extended-wear hydrogel contact lenses that are intended to be worn either six-nights-on, one-night-off and then discarded or on a daily basis and discarded every two weeks. Disposability is practical because these lenses are inexpensive.

Disposable soft contact lenses may have several advantages. First, they may reduce problems caused by noncompliance with good lens care because less lens cleaning or disinfection is required. Furthermore, the risks associated with aging lenses, such as cracks or other surface defects that might allow microbial penetration or deposits that might facilitate bacterial adherence, should be reduced. Other possible benefits include eliminating some of the allergic and toxic complications of contact lens care products. Despite all these advantages, the disposable lens has an oxygen transmissibility that is similar to other hydrogel contact lenses. In other words, this lens may be just as likely to cause chronic hypoxic stress to the cornea as other hydrogel lenses when used on an extended-wear basis. Although bacterial corneal ulcers have been associated with the use of disposable lenses, it is not known whether they are safer than other hydrogel lenses in this regard.

BARTLY J. MONDINO, MD
Los Angeles

REFERENCES

- Adams CP, Cohen EJ, Laibson PR, et al: Corneal ulcers in patients with cosmetic extended-wear contact lenses. *Am J Ophthalmol* 1983; 96:705-709
- Dunn JP Jr, Mondino BJ, Weissman BA, et al: Corneal ulcers associated with disposable hydrogel contact lenses. *Am J Ophthalmol* 1989; 108:113-117
- Mondino BJ, Weissman BA, Farb MD, et al: Corneal ulcers associated with daily-wear and extended-wear contact lenses. *Am J Ophthalmol* 1986; 102:58-65
- Schein OD, Glynn RJ, Poggio EC, et al: The relative risk of ulcerative keratitis among users of daily-wear and extended-wear contact lenses—A case-control study—Microbial Keratitis Study Group. *N Engl J Med* 1989; 321:773-778

Update on Retinopathy of Prematurity

RETINOPATHY OF PREMATURE (ROP), previously known as retrolental fibroplasia, is a proliferative disorder of infant retinal blood vessels that can lead to blindness. While previously associated with the administration of oxygen in excess of need, the single most important factor that determines whether the condition develops under conditions of modern neonatal intensive care is the degree of an infant's prematurity. Although most cases of ROP regress spontaneously, infants with very low birth weights have a greatly increased incidence of ROP that is likely to be severe. With recent increased survival rates for infants weighing much less than 1,000 grams at birth, blindness due to ROP has become an international concern.

Retinopathy of prematurity now is classified according to an international system that allows clinical investigators to communicate better. Using that system, a multicenter clinical trial (Cryo-ROP) showed that cryotherapy administered for stage III+ ROP approximately halved the rate of poor anatomic outcomes as defined by the study. In the Cryo-ROP study, only one eye of symmetrically affected infants was treated, and current recommendations generally continue this practice because of the unknown long-term fate of treated eyes.

The availability for the first time of effective treatment